

WHAT IS CLAIMED IS:

1. A method of controlling contraction of a heart, comprising:
receiving signals indicating electrical activity of sinus rhythm at a portion of the heart;
detecting an event in the electrical activity at the portion of the heart;
detecting when the electrical activity at an additional portion of the heart reaches a threshold within a predetermined period of time of the event; and
suppressing contraction in the additional portion of the heart based on when the electrical activity reaches the threshold.
2. The method of claim 1, wherein receiving signals indicating electrical activity comprises sensing depolarization signals originating from an atrium.
3. The method of claim 2, wherein suppressing contraction of the additional portion of the heart comprises suppressing contraction of a ventricle.
4. The method of claim 2, wherein sensing depolarization signals comprises sensing depolarization signals from both the left atrium and the right atrium.
5. The method of claim 1, wherein detecting an event in the electrical activity comprises detecting a P-wave in an electrocardiogram signal of the heart.

6. The method of claim 1, wherein suppressing contraction in the additional portion of the heart comprises applying, to the portion of the heart, at least one pulse that repolarizes the additional portion of the heart to a voltage less than a threshold sufficient for contraction.

7. The method of claim 6, wherein applying the voltage comprises applying at least one anodal pulse.

8. The method of claim 1, further comprising:
applying a pulse to stimulate contraction in the additional portion of the heart after suppressing contraction.

9. The method of claim 8, wherein applying the pulse to stimulate contraction comprises applying the pulse to stimulate contraction in a ventricle.

10. An apparatus for controlling contraction of a heart, comprising:
means for receiving signals indicating electrical activity of sinus rhythm at a portion of the heart;
means for detecting an event in the electrical activity at the portion of the heart;
means for detecting when the electrical activity at an additional portion of the heart reaches a threshold within a predetermined period of time of the event;
and
means for suppressing contraction in the additional portion of the heart based on when the electrical activity reaches the threshold.

11. A system for controlling contraction of a heart, comprising:
at least one sensing element configured to receive signals indicating electrical activity of sinus rhythm of the heart;
a processor coupled to the at least one sensing element, configured to detect an event in the electrical activity, and provide a control signal based on when the electrical activity reaches a threshold within a predetermined period of time of the event; and
a signal generator, coupled to the processor, to provide an electrical signal suppressing contraction in a portion of the heart responsive to the control signal.

12. The system of claim 11, wherein the signal generator comprises a pulse generator configured to generate at least one pulse that repolarizes the portion of the heart to a voltage less than a threshold sufficient for contraction.

13. The system of claim 12, wherein the pulse generator is further configured to generate at least one pulse to stimulate contraction of the portion of the heart after suppressing contraction.

14. A method for controlling contraction of a heart, comprising:
receiving signals indicating electrical activity of sinus rhythm from a portion of the heart;
detecting an event in the electrical activity; and
suppressing contraction in an additional portion of the heart for a predetermined period of time from the detected event.

15. The method of claim 14, further comprising:
stimulating contraction in the at least one additional portion of the heart subsequent to suppressing contraction.

16. The method of claim 14, wherein receiving signals indicating electrical activity comprises sensing depolarization signals originating from an atrium.

17. The method of claim 16, wherein sensing depolarization signals comprises sensing depolarization signals from both the left atrium and the right atrium.

18. The method of claim 14, wherein suppressing contraction in the additional portion of the heart comprises suppressing contraction of a ventricle.

19. The method of claim 14, wherein detecting an event in the electrical activity comprises detecting a P-wave in an electrocardiogram signal of the heart.

20. The method of claim 14, wherein suppressing contraction in the additional portion of the heart comprises applying, to the additional portion of the heart, at least one pulse that repolarizes the additional portion of the heart to a voltage less than a threshold sufficient for contraction.

21. The method of claim 20, wherein applying the voltage comprises applying at least one anodal pulse.

22. The method of claim 14, further comprising:
applying a pulse to stimulate contraction in the additional portion of the heart after suppressing contraction.

23. The method of claim 22, wherein applying the pulse to stimulate contraction comprises applying the pulse to stimulate contraction in a ventricle.

24. An apparatus for controlling contraction of a heart, comprising:
means for receiving signals indicating electrical activity of sinus rhythm from a portion of the heart;
means for detecting an event in the electrical activity; and
means for suppressing contraction in an additional portion of the heart for a predetermined period of time from the detected event.

25. The apparatus of claim 24, further comprising:
means for stimulating contraction in the additional portion of the heart after suppressing contraction.

26. A system for controlling contraction of a heart, comprising:

- at least one sensing element configured to receive signals indicating electrical activity of sinus rhythm from at least a portion of the heart;
- a processor coupled to the at least one sensing element, configured to detect an event in the electrical activity, and provide a control signal in response to the detected event; and
- a signal generator configured to provide an electrical signal to suppress contraction in an additional portion of the heart for a predetermined period of time from the event in response to the control signal.

27. The system of claim 26, wherein the signal generator is configured to provide a stimulating electrical signal to stimulate contraction in the additional portion of the heart.

28. The system of claim 26, further comprising a stimulator configured to provide at least one stimulating electrical pulse to stimulate contraction in the at least one additional portion of the heart.

29. A method of controlling contraction of a heart, comprising:
receiving signals indicating electrical activity of sinus rhythm from the heart;
suppressing premature contraction of a first chamber of the heart;
detecting when electrical activity at a second chamber of the heart reaches a threshold; and
ceasing the suppression of contraction of the first chamber of the heart based on when the electrical activity at the second chamber of the heart reaches the threshold.

30. The method of claim 29, wherein receiving the signals indicating electrical activity comprises sensing depolarization signals originating from a ventricle of the heart.

31. The method of claim 30, wherein suppressing contraction of the first chamber of the heart comprises suppressing contraction of a ventricle.

32. The method of claim 29, wherein suppressing contraction in the first chamber of the heart comprises applying, to the first chamber, at least one pulse that repolarizes at least a portion of the first chamber to a voltage less than a threshold sufficient for contraction.

33. The method of claim 32, wherein applying the voltage comprises applying at least one anodal pulse.

34. The method of claim 29, further comprising stimulating contraction of the first chamber of the heart when the electrical activity at the second chamber of the heart reaches the threshold.

35. The method of claim 29, wherein suppressing contraction of the first chamber of the heart comprises suppressing contraction of a left ventricle of the heart.

36. The method of claim 35, wherein detecting when the electrical activity at the second chamber reaches the threshold comprises detecting when the electrical activity at a right ventricle of the heart reaches the threshold.

37. The method of claim 36, wherein ceasing the suppression of contraction of the first chamber of the heart comprises allowing the left ventricle to contract.

38. An apparatus for controlling contraction of a heart, comprising:
means for receiving signals indicating electrical activity of sinus rhythm from the heart;
means for suppressing contraction of a first chamber of the heart based on the received signals;
means for detecting when electrical activity at a second chamber of the heart reaches a threshold based on the received signals; and
means for ceasing the suppression of contraction of the first chamber of the heart based on when the electrical activity at the second chamber of the heart reaches the threshold.

39. A system for controlling contraction of a heart, comprising:
at least one sensing element configured to receive signals indicating electrical activity of sinus rhythm of the heart;
a processor coupled to the at least one sensing element, configured to determine when a first chamber of the heart is contracting, and provide a control signal based on when the electrical activity of a second chamber of the heart reaches a threshold; and
a signal generator, coupled to the processor, to selectively provide an electrical signal suppressing contraction in the first chamber of the heart responsive to the control signal.

40. The system of claim 39, wherein the signal generator comprises a pulse generator configured to generate at least one pulse that repolarizes at least a portion of the first chamber of the heart to a voltage less than a threshold sufficient for contraction.

41. The system of claim 40, wherein the pulse generator is further configured to generate at least one pulse to stimulate contraction of the first chamber of the heart in response to the control signal.